

REMARKS

Claims 1-22 are presently pending. In the above-identified Office Action, Claims 3, 5, 6, and 16-20 were withdrawn from consideration. Claims 1, 2, 4, 7-15, 21 and 22 were rejected. Examiner employs Lowry to reject Claims 1, 2, 4, 7-15, 21, and 22, suggesting that Lowry discloses means for changing pressure of oil from a first pressure to a second pressure. Examiner employs Fawcett et al. to reject 1, 2, 4, 7, 8, 9, 10, 11, 13, 14, and 15, suggesting that Fawcett et al. show channels 4 in an evaporation surface sufficient to enhance evaporation efficiency and that that Fawcett et al. disclose means 5 for causing cavitation. Examiner employs Christensen et al. to reject Claims 1, 2, 4, 7, 8, 9, 10, 11, 13, 14, and 15, suggesting that Christensen et al. state that spiral capillary channels are known in the art (line 62, Col. 3 to line 35 of Col. 4). Examiner employs Arntz to reject Claims 10, and 15, suggesting that Arntz discloses jets 60 capable of causing cavitation (cavitation is tantamount to boiling a fluid) since they are funnel-shaped and suggests that such an arrangement facilitates removal of volatile contaminants from the fluid. Examiner employs Liaw to reject Claims 11, 13, and 15, suggesting that Liaw discloses an oil filter equipped with an electromagnetic coil 20 disposed about an analogous chamber (see Fig. 3 of Liaw). Examiner employs Miller to reject Claims 14 and 21, suggesting that Miller discloses corrugations 24 for expanding evaporation surface area. Examiner employs Priest to reject Claim 4, suggesting that Priest discloses a vent 150 for venting contaminants through a ceiling.

By this Amendment, Applicant has cured objections to the Claims, Specification, and Drawings. Reconsideration and passage to issue are respectfully requested.

REJECTIONS BASED ON 35 U.S.C. 112

Claims 1, 2, 4, 7-15, 21 and 22 were rejected under 35 U.S.C. 112, first paragraph as failing to comply with the enablement requirement. Examiner suggests that the claims contain subject matter that was not sufficiently described in the Specification to enable one

skilled in the art to make or use the invention. Particularly, Examiner suggests that the first and second means of Claim 1; the means for employing siphoning action of Claim 2; the means for squirting of Claim 8; the means for causing cavitation of Claim 9; the first means and second means recited in Claim 12; the first means and second means recited in Claim 15, the means for expanding recited in Claim 21, and the first means and second means recited in Claim 22. Examiner suggests that the Specification be amended to define the structure associated with the means-plus-function language to obviate rejections to Claims 1, 2, 8, 9, 12, 15, 21, and 22.

**Rejections of Claims 1, 2, 8, 9, 12, 15, 21, and 22 Under 35 U.S.C. 112:
Recited Means-Plus-Function Language is Clearly Supported**

Applicant objects to rejections to the above-mention claims under 35 U.S.C. 112. In particular, regarding Claim 1, mechanisms for changing the pressure of a fluid from a first pressure to a second pressure are clearly shown and described in the Specification. See the paragraph beginning on page 10, line 24, which explains how oil is released from engine pressure to atmospheric pressure within the chamber 54. One skilled with access to the teachings of the Specification could readily reproduce this effect to implement the *first means* without undue experimentation. Similarly, mechanisms, such as the evaporation surface 80, for distributing fluid within the evaporation chamber 54 are clearly shown and sufficiently described to enable one skilled in the art to practice the *second means*. Accordingly, Claim 1 should not be rejected under 35 U.S.C. 112.

Furthermore, regarding Claim 1, Examiner suggests that in preamble of Claim 1 it is unclear whether "fluid" or "oil" is being claimed. Claim 1 should not be limited to oil, as the system of Claim 1 could be used to clean other types of fluids. Clearly, oil is a type of fluid. As is known in the art, a fluid is anything that flows, such as in response to a shearing stress, which includes air, water, oil, gas, plasma, and so on. Accordingly, the preamble of Claim 1 clearly defines the scope of what Applicant regards as the invention and should remain.

Regarding Claim 2, mechanisms for siphoning 222, 232 are clearly shown and sufficiently described in the Specification to enable one skilled in the art to practice the *means for employing siphoning action* without undue experimentation. See paragraph beginning on page 23, line 20, where siphoning action implemented by the capillary channels 222 is sufficiently described to enable one skilled in the art to make and use the capillary channels 222 and 232, which are clearly disclosed in the elected species of Fig. 10.

Regarding the means for squirting of Claim 8, the Specification clearly discloses mechanisms 236 for squirting oil within the evaporation chamber 54 to enhance effective evaporation surface area. See paragraph beginning on page 26, line 6, which explains use of cavitation perforations to squirt oil within the chamber 54. Those skilled in the art with access to the teachings of the Specification may readily produce such perforations without undue experimentation. Accordingly, Claim 8 should not be rejected under 35 U.S.C. 112.

Similarly, regarding Claim 9, mechanisms for causing cavitation are clearly described in the Specification (See paragraph beginning on page 26, line 9). Regarding Claim 12, a mechanism for changing the pressure of a fluid from a first pressure to a second pressure and mechanisms for distributing the fluid within an evaporation chamber are clearly described in the Specification (See comments herein pertaining to Claim 1). Similar reasoning applies to the first means and the second means recited in Claim 15. Regarding Claim 21, mechanisms for expanding an evaporative surface area are clearly disclosed in the Specification. See the paragraph beginning on page 11, line 21, which clearly describes how the surface 80 is ridged and textured to maximize the surface area of the surface 80. Regarding Claim 22, the Specification clearly shows a mechanism for removing solid material from a fluid (see Filter 52) and a mechanism for facilitating vaporizing liquids or gasses in the fluid by squirting (see cavitation jets 236).

Accordingly, rejections of 1, 2, 8, 9, 12, 15, 21, and 22 under 35 U.S.C. 112 are unfounded. Furthermore, Applicant finds no legal statute requiring that means language must be employed in the Detailed Description to justify use of means language in the claims. Nevertheless, Applicant has amended the Specification to include means language

to further obviate rejections under 35 U.S.C. 112, understanding that this added language should in no way further limit the scope of the Claims. If Examiner objects to Applicant's additions to the Specification, i.e., the association of structure with the means language, as constituting the addition of new matter to the Specification, then Applicant requests that the objection under 35 U.S.C. 112 be withdrawn for the reasons set forth above and that the corresponding edits be canceled. Alternatively, Examiner may make appropriate edits or deletions by Examiner's Amendment to bring the Application into condition for allowance. Applicant requests that before Examiner makes any such edits that Examiner discuss the proposed edits with Applicant.

**Rejection of Claims 10, 13, and 15 under 35 U.S.C. 112:
Specification Clearly Describes How to Make Electromagnet**

Concerning Claims 10, 13, and 15 examiner suggests that the Specification fails to adequately disclose how to form the recited electromagnet. Specifically, Examiner suggests that no pole piece or magnet induction member for collecting and concentrating the lines of magnetic force to enable connection of metallic particles has been disclosed in the Specification.

However, magnetic fields produced by solenoids are well known and do not require a pole piece, core, or other magnet induction member to concentrate lines of magnetic force. The magnetic field pattern produced by a solenoid is similar to that produced by a bar magnet. The north and south pole of the solenoid are determined by the direction of current flow through the wires comprising the solenoid. Solenoids are widely employed as actuators in electromagnetic relays, locks, and other devices.

The Specification clearly describes the structure of the solenoid, i.e., electromagnet. Furthermore, the Specification clearly describes a mechanism to enable collection of metallic particles via the electromagnetic coil disclosed in Fig. 3. Specifically, the paragraph beginning on page 24, line 14 states that "The electromagnet/heater coil 90 will attract any remaining metallic particles to the surface 238 of the tube wall 230." Particles will clearly be caught in the capillary channels 222, 232 of

the evaporation surface 238 or threads of the surface 80. Metallic particles (such as ferromagnetic particles) will experience a force due to the magnetic field within the solenoid formed by the coil 90. The exact direction of this force is immaterial, since if the force were vertical, i.e., parallel to the longitudinal axis of the chamber 54, some particles would collect on the sides (top or bottom sides) of the capillary channels 222, 232 or at the bottom or top of the evaporation chamber 54. If the force were sideways, i.e., perpendicular to the longitudinal axis, particles would collect at the bottoms of the capillary channels 222, 232.

Those skilled in the art will appreciate that any coil that has a current flow therein will produce a magnetic field in accordance with Faraday's Law of Electromagnetic Induction and Lenz's Law and that the coil does not require a magnet induction member or pole piece to produce a magnetic force field. Those skilled in the art will know that if the coil is constructed as depicted in Fig. 3, that metallic particles will be pulled from the oil due to the induced magnetic flux and corresponding magnetic force field.

For more information, see page 1214 of Physics, Volume 2, *Electricity, Magnetism, and Light*, by Ronald Blum and Duane E. Roller, published by Holden-Day, ISBN 0-8162-7285-9, which shows the magnetic field produced by a coil similar to that of the present invention and having a current therein. Note that the magnetic field is perpendicular to the direction of the current and that a charged particle will experience a force perpendicular to the axis of a coil. For additional information, see pages 717-731 and page 756 of *Physics, Part 2, Extended Version* by David Halliday and Robert Resnick, published by John Wiley and Sons, ISBN 0-471-83202-2.

Furthermore, Examiner cites Liaw, which does not show "a pole piece or magnet induction member for collecting and concentrating the lines of magnetic force to enable connection of metallic particles" as Examiner suggests is required. The fact that Liaw does not disclose such a pole piece or member supports Applicant's assertion that a pole piece is not required. If Examiner has further doubts, a prototype comprising a small battery, resistor, coil wrapped around a small tube, and some metallic filings may easily be constructed.

Hence, none of the Claims contain subject matter that was not described in the Specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. Furthermore, all of the Claims distinctly claim the subject matter to which applicant regards as the invention. Accordingly, no basis exists for rejection of the Claims under 35 U.S.C. 112.

REJECTION OF CLAIM 7 UNDER 37 CFR 1.83(a)

The drawings were objected to under 37 CFR 1.83(a) for failing to show a species that is oriented at an angle as recited in Claim 2 or in a near horizontal position as recited in Claim 7. By this amendment, Applicant has inserted Fig. 12, which shows the species of Fig. 3 angled in a near horizontal position. No new matter was added, as the matter of Fig. 12 was already present in the Specification.

APPLICANT OBJECTS TO WITHDRAWAL OF CLAIMS 3, 5, 6, AND 16-20 FROM CONSIDERATION

The original restriction between Group I (Claims 1-15) and Group II (Claims 15-19) was withdrawn. In the above-identified Office Action, Examiner changed the restriction, implying that Claims 3, 5, 6, and 16-20 belong to a group associated with a non-elected species and consequently, are withdrawn from consideration. However, Claims 3, 5, 6, and 16-20 belong to elected species as discussed more fully below.

Applicant objects to the withdrawal of Claim 3 from consideration. In particular, all limitations recited in Claim 3 are shown in the elected species of Figs. 3 and 10. In particular, Claim 3 includes limitations directed toward the use of substantially parallel or cylindrical walls and an evaporation surface that is contoured to promote dripping from the edges of the contours. The elected species of Fig. 10 clearly shows a contoured evaporation surface that may promote dripping from the edges of the contours as specifically stated on page 26, lines 1-5, with reference to Fig. 10. Furthermore, the surface depicted in Fig. 10 and applied to the species of Fig. 3 would show a species

having substantially parallel or cylindrical walls (note that a horizontal cross-section of the surface at any location would yield a circle). Nevertheless, the limitations referring to cylindrical or parallel walls were removed for clarity.

Similarly, Applicant objects to the withdrawal of Claim 5 from consideration. All limitations of Claim 5 are either clearly shown in the species of Figs. 3 and/or 10 or are discussed in the Specification with reference to those species. In particular, Claim 5 recites limitations referring to a vent that includes a valve biased in an open position (see vent 86 of Fig. 3) and an evaporation surface that includes polygon-shaped perforations therein. The Specification does not state that the cross-sectional shapes of the perforations in Fig. 10 do not have polygon cross-section, but rather the Specification specifically discusses use of polygon perforations on page 21, lines 11-14. Clearly, the perforations shown in Figs. 3 and/or 10 can include perforations with polygon-shaped cross-section as stated in the Detailed Description.

Similarly, Applicant objects to the withdrawal of Claim 6 from consideration. All limitations recited specifically in Claim 6 exist in the embodiment of Fig. 3. Claim 6, which was dependent from Claim 5, is hereby amended to be dependent from Claim 4.

Claims 16-19, which were withdrawn from consideration, were either amended to more clearly define an invention shown in the embodiment of Fig. 3. Claim 20, which is dependent from Claim 19, now reads upon the species of Fig. 3. Accordingly, Applicant requests that Claims 16-20 be reconsidered, since all limitations recited in Claims 16-20 as amended exist in the embodiment of Fig. 3.

REJECTIONS UNDER 35 U.S.C. 102(e) AND 103(a) BASED ON LOWRY

Applicant's records indicate that Applicant filed a declaration under 37 CFR 1.131 to swear behind Lowry. However, Examiner has neither indicated receipt of the declaration nor explained why it was not entered if it was received. Accordingly, attached to this Amendment, Applicant is submitting another copy of the Declaration under 37 CFR 1.131. The accompanying Declaration should be sufficient to obviate rejections based on Lowry.

However, even without the above-mentioned Declaration, Lowry should not have been employed to reject Applicant's Claim 9 involving use of a mechanism for causing cavitation and Applicant's Claim 8 involving a mechanism for squirting oil to maximize evaporation surface area.

Regarding Claim 8, Examiner suggests that Lowry discloses means capable of squirting 58, and therefore Lowry has anticipated use of a mechanism for squirting to maximize vaporization of contaminants. However, the mere use of a hole in a fluid cleaning system neither teaches, discloses, nor suggests, the use of squirting within a chamber to enhance effective fluid evaporation surface area within the chamber. Squirting requires a sufficient pressure drop across a hole in relation to the size of the hole. Lowry neither teaches, discloses, nor suggests mechanisms for strategically squirting oil or fluid. If it were obvious to greatly enhance evaporation rates in a chamber by squirting fluid within the chamber, then surely it would be disclosed in the art of record due to the significant unexpected results (several fold increase in evaporation surface area) afforded thereby.

Regarding Claim 9, Examiner suggests that Lowry discloses means capable of causing cavitation 58. However, merely disclosing holes in a surface neither teaches, discloses, nor suggests use of cavitation to facilitate removal of contaminants from a fluid. A mere hole, such as disclosed in Lowry, will not yield cavitation. The dimensions and shape of a hole must be properly chosen in relation to the pressure drop across the hole in accordance with Bernoulli's Equation and the Continuity Equation as discussed in Applicant's Detailed Description. Furthermore, use of cavitation to produce surprising unexpected results, namely significantly enhanced contaminant vaporization efficiency and evaporation rates, is neither anticipated by Lowry nor by other art of record.

Due to the significant expansion of fluid surface and resulting proportional increase in rate of evaporation due to mechanisms for strategically squirting and/or cavitating oil and the fact the art of record fails to teach this, suggests that it is neither obvious to cavitate nor obvious to squirt oil in an evaporation chamber to facilitate removal of contaminants from fluid.

Furthermore, the remaining cited art should not be employed to reject Applicant's Claims, since Examiner relied on combinations of the other cited art with Lowry, and Lowry should be obviated by Applicant's Declaration under Rule 131. The following discussion pertaining to rejections based on the remaining art of record merely provides additional reasons (which should not be required to make a case for allowability of the invention as claimed) as to why the art of record should not be employed to reject Applicant's Claims.

REJECTIONS BASED ON FAWCETT ET AL. UNDER 35 U.S.C. 103(a)

Examiner employs Fawcett et al. to reject 1, 2, 4, 7, 8, 9, 10, 11, 13, 14, and 15, suggesting that Fawcett et al. show channels 4 in an evaporation surface sufficient to enhance evaporation efficiency and that Fawcett et al. disclose means 5 for causing cavitation (see rejection of Claim 9 at the top of page 8 of the above-identified Office Action).

However, as discussed above with reference to Lowry, merely disclosing holes in a surface (as does Fawcett et al.) neither teaches, discloses, nor suggests use of cavitation to facilitate removal of contaminants from a fluid. A mere hole will not yield cavitation unless the dimensions, shape, and pressure drop are specifically designed to yield cavitation.

To reject Applicant's Claims directed to use of capillary channels to enhance evaporation via capillary channels, Examiner suggests that the channels 4 in Fawcett et al. redistribute the film to break up surface layers of partially evaporated liquid and expose fresh outer surface layers of the film to increase evaporation efficiency. However, breaking up surface layers to expose fresh outer surface layers is entirely different than employing capillary channels to disperse oil about an evaporation surface via capillary action to facilitate evaporation of contaminants from within a fluid, such as oil. Fawcett et al. neither teach, disclose, nor suggest such use of capillary action or cavitation to remove contaminants.

Furthermore, Fawcett et al. discloses a distillation device designed to collect distillate on a surface 2. This suggests that Fawcett et al. address a different problem, namely, collecting distillate (volatile constituent of the so-called distilland), than that addressed by the present invention. Consequently, Fawcett et al. should not be employed to reject Applicant's Claims.

REJECTIONS BASED ON CHRISTENSEN ET AL. UNDER 35 U.S.C. 103(a)

Examiner employs Christensen et al. to reject Claims 1, 2, 4, 7, 8, 9, 10, 11, 13, 14, and 15, suggesting that Christensen et al. state that spiral capillary channels are known in the art (line 62, Col. 3 to line 35 of Col. 4). Examiner further suggests (see rejection of Claim 7) that the channels disclosed in Christensen et al. are partially circular and sufficiently deep to distribute oil about a circumference of the evaporation chamber when the fluid cleaning system and evaporation chamber are in a near horizontal position.

Christensen et al. Address Different Problems

Christensen et al. address different problems than those of the references and that of the present invention. Consequently, Christensen et al. should not be employed to reject Applicant's Claims either alone or in combination with the other cited references (**In re Wright**, 6 USPQ 2d 1959 (1988)).

Christensen et al. do not show capillary channels employed to disperse oil about an evaporation surface via capillary action to facilitate evaporation of *contaminants* from within a fluid as recited in Applicant's Claims (emphasis added). Rather, Christensen et al. disclose vaporization of the fluid itself (see column 4, lines 7-9), such as might be employed in refrigeration machines (see column 1 background section). Vaporizing the fluid is different than cleaning a fluid. Applicant's invention in no way intends to vaporize oil.

Furthermore, as is evident from the figures of Christensen et al., the capillary twisted fluted tube windings 90 lacking holes therethrough (see Fig. 13 for example) are

significantly different than the corresponding channels of the present Application. Implementation of the tube windings 90 in the device of the present invention would require unobvious modification.

While Christensen et al. mention placing a tube in a generally horizontal position, this horizontal position is required for Christensen et al. to operate properly, namely, to enable vapor expulsion through a slit 58 (see column 3, line 65-66, and 52 of Figs. 4 and 5). This is unlike the present invention, where the flexibility to operate in a near-horizontal position is an unexpected beneficial and unobvious result, not a requirement.

Christensen et al. neither teach, disclose, nor suggest use of capillary channels in an oil reclamation device, which is not shown in the art of record. If it were obvious to employ spiral capillary channels in an oil recycling system, then surely it would have been implemented due to the significant advantages afforded thereby.

REJECTIONS BASED ON ARNTZ UNDER 35 U.S.C. 103(a)

Examiner employs Arntz to reject Claims 10, and 15, suggesting that Arntz discloses jets 60 capable of causing cavitation, since they are funnel-shaped and suggests that such an arrangement facilitates removal of volatile contaminants from the fluid.

However, use of channels that are funnel-shaped in no way teaches, discloses, nor suggests use of cavitation to remove volatile contaminants from a fluid. A mere funnel-shaped channel would not produce cavitation unless the dimensions were properly chosen to yield cavitation, such as in accordance with Bernoulli's Equation and the Continuity Equation as discussed above. Furthermore, Arntz does not disclose use of spray to increase evaporation surface area.

REJECTIONS BASED ON LIAW UNDER 35 U.S.C. 103(a)

Examiner employs Liaw to reject Claims to reject Claims 11, 13, and 15, suggesting the Liaw discloses an oil filter equipped with an electromagnetic coil 20

disposed about an analogous chamber (see Fig. 3 of Liaw) that enables fine ferromagnetic particles to be removed from the fluid and also is capable of acting as a heater.

However, Liaw does not teach, disclose, nor suggest use of the coil as a heater and an electromagnet. A mere electromagnet will not act as a heater sufficient to facilitate removal of volatile contaminants from a fluid (see Claim 11). The coil must have a sufficient resistance and current to result in sufficient heat, which is a function of the square of the current multiplied by the resistance (see paragraph beginning on page 24, line 8). Generally, electromagnets are manufactured with wires that have minimum resistance (R) to maximize the magnetic field (B), which is approximately $B = \mu_0(v/R)n$, where v is the voltage drop across the coil, n is the number of turns in the coil, and μ_0 is the permeability constant. Accordingly, it would be counter-intuitive, i.e., unobvious to one skilled in the art to increase the resistance of a coil to provide effective heating of an evaporation surface and to remove metallic contaminants from a fluid. Even if the electromagnetic coil of Liaw did provide heating, it would be useless in Liaw's device, since Liaw does not disclose an evaporation surface. Accordingly, it would be unobvious to one skilled in the art to modify Liaw to teach the invention as Claimed.

Liaw neither discloses an evaporation chamber nor discloses use of an electromagnetic coil with an evaporation chamber. The chamber disclosed in Liaw is a conventional hollow space existing in typical spin-on filters. This space is virtually wasted space and is analogous to the space 32 of Fig. 1 of Applicant's Specification (see paragraph beginning on page 8, line 32 of the Specification). Accordingly, Liaw does not teach, disclose, nor suggest use of an electromagnetic coil employed in combination with an evaporative surface, and consequently, should not be employed to reject Applicant's Claims.

Furthermore, Liaw teaches away from employing a magnet in the position suggested by Applicant (about an evaporation chamber at the second pressure), suggesting that particles would be peeled off in masses by oil current if the magnet is positioned after the filter (see column 1, lines 30-35). Applicant's efficient capillary channels, which catch such particles, prevent them from being peeled off by oil flow rate. Furthermore, since the

magnetic filed would be distributed about the evaporation chamber, any peeled off particles would be caught as they flowed down the walls of the surface.

If it were obvious to employ a coil that acts as both an electromagnetic and a heater element, then surely it would be anticipated in the art of record. Since this dual-use of a coil is neither taught, disclosed, nor suggested by the art of record, its use in a fluid cleaning device as recited in Applicant's claims is unobvious.

REJECTIONS BASED ON MILLER UNDER 35 U.S.C. 103(a)

Examiner employs Miller to reject Claims 14 and 21, suggesting that Miller discloses corrugations 24 for expanding evaporation surface area. However, it would be unobvious to modify the system of Miller to show a surface with holes therethrough with capillary channels therein. To make such a modification would require a complete redesign of Miller, since Miller's surface is not adapted to receive fluid radially though the surface. Such a combination would only be made in hindsight, and such a combination should not be made. Combinations of many references (at least four) are employed by Examiner to develop an argument to reject Claims 14 and 21, which is further evidence of unobviousness.

REJECTIONS UNDER NONSTATUTORY DOUBLE PATENTING BASED ON US 3,638,497

Examiner employs U.S. Patent 3,638,497 assigned to Applicant to reject Claims 1, 2, and 4-9 as being unpatentable over Claims 1-3 of US 3,638,497 in view of Fawcett et al. and Christensen et al. Applicant notes that since the present application complies with 35 USC 120 and that the Claims are not directed entirely to material claimed in the previous application and that Examiner required a restriction on the previously-filed Application (now US 3,638,497) that therefore 35 USC 121 applies to this Application. Accordingly, US 3,638,497 should not be used as a reference to reject claims of the

current Application. Nevertheless, Applicant has provided further evidence set forth below suggesting that US 3,638,497 should not be employed to reject Applicant's Claims.

Claim 1 of the present Application recites the use of "capillary channels for dispersing oil about said evaporation surface via capillary action to facilitate evaporation of contaminants from within said fluid." Claims 1-3 of US 3,638,497 neither teach, disclose, nor suggest use of capillary channels as recited above. Considering significant benefits afforded thereby, such as improved vaporization of contaminants, the Claim 1 and associated dependent Claims 1-9 of the present Application are not obvious in view of Claims 1-3 of US 3,638,497. Similar reasoning applies to the rejection of Claims 14 and 15.

Similarly, as indicated above, Fawcett et al. and Christensen et al. neither teach, disclose, nor suggest use of capillary channels to facilitate evaporation of volatile *contaminants* from a fluid, such as oil. Accordingly, they should not be employed to reject Applicant's Claims directed to such use of capillary channels. Similarly, Liaw, which was employed to reject Claim 11, should not be employed to reject Applicant's Claims for the reasons set forth above.

Examiner employed Claim 1 and Claims 1-3 of US 3,638,497 to reject Claims 12 and 13 of the current Application, respectively, which include limitations pertaining to the use of cavitation perforations to cause cavitation of contaminants. Claims 1-3 of US 3,638,497 neither teach, disclose, nor suggest use of cavitation perforations to cause cavitation of contaminants from a fluid. Considering significant benefits afforded thereby, such as improved vaporization of contaminants, the Claim 1 and associated dependent Claims 1-9 of the present Application are not obvious in view of Claims 1-3 of US 3,638,497. Those skilled in the art will appreciate that specific design criteria must be met to enable cavitation. Simply disclosing use of a hole through which fluid can pass is insufficient to teach, disclose, or suggest the use of cavitation perforations to cause contaminants to cavitate.

Cavitation yields significant and unexpected results. Namely, cavitation results in the formation of many small vapor bubbles in the fluid, since the fluid actually boils. These vapor bubbles will contain volatile contaminants, which are boiled off in the

chamber at less than the boiling point of the fluid. See paragraph beginning page 26, line of the present Specification, which describes cavitation in more detail. If Lowry or Fawcett et al. were aware of use of cavitation perforations, then surely they would have disclosed use of cavitation due to the significant advantages achieved thereby. As a further reference, see the book entitled, FUNDAMENTALS OF FLUID MECHANICS, by Bruce R. Minson, Donald F. Young, and Theodore H. Okiishi, and published by John Wiley & Sons, Inc. 1994, ISBN 0-471-57958-0.

Similar reasoning applies to the rejection of Claim 15 based on US 3,638,497. Claim 15 also recites use of cavitation. Examiner further employs Lowry, Fawcett et al., Christensen et al., Arntz, and Liaw to reject Claim 15. The large number of references needed to form a rejection of Claim 15 suggests that Claim 15 is not obvious. Furthermore, the references should not have been combined to reject Claim 15 as discussed above.

Examiner's rejection of Claim 21 is noted. In the event that Applicant's Declaration under Rule 131 is accepted and obviates Lowry, Applicant will consider investing in filing a Terminal Disclaimer along with this Amendment to obviate rejection of Claim 21 in view of US 3,638,497. Any Terminal Disclaimer should only be applied to Claim 21, unless Examiner and Applicant subsequently reach a different understanding. Applicant notes that Examiner did not introduce a rejection to Claim 22 based on US 3,638,497 in the above-identified Office Action.

UNSUGGESTED COMBINATION OF REFERENCES

The references cited do not suggest, expressly or implied, that they be combined to teach the invention as claimed. Hence, they should not be combined to reject Applicant's Claims as maintained by **In re Wright**, 6 USPQ 2d 1959 (1988). Furthermore, strained interpretations were relied upon to combine the references to reject the claims.

In the above-identified Office Action, the suggestion to combine features from the various references to show the present invention has not come from the prior art references themselves. Prior art references themselves should suggest that they be

combined for rejection of claims under 35 U.S.C. 103, which was forcefully stated, for example, in **In re Sernaker**, 217 U.S.P.Q. 1, 6 (CAFC 1983):

"[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings."

Nothing in the prior art references suggests any advantage to be obtained from their combination, nor do they suggest any advantages due to cavitating contaminants or due to squirting fluid to remove volatile contaminants as claimed in Applicant's Claims. The suggested combination of references cited by Examiner required hindsight.

In **In re Ratti**, 270 F.2d 810, 123 USPQ 349 (CCPA 1959), the court reversed a rejection based on a combination of references, holding that the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 123 USPQ at 352.). Similarly, for the cited combination of references to be combined in the manner suggested to disclose the invention as claimed, would require substantial unobvious reconstruction and re-design of constituent elements. In addition, if the references cited were simply combined without significant modification, the resulting combination would not teach, disclose or suggest the invention as claimed and would reflect a change in basic principles under which the invention as claimed is designed to operate.

A combination of the references would teach at most a fluid cleaning system having an evaporation surface and an electromagnet coil surrounding the exterior of a device having an evaporation chamber. Neither squirting to remove volatile contaminants, capillary channels to remove volatile contaminants, nor a combination heater and electromagnetic coil in communication with an evaporation chamber are taught, disclosed, or suggested by the references. Furthermore, the references taken alone or in combination

would not reflect the overall principles of maximizing contaminant evaporation surface area and effectiveness by employing such mechanisms.

LONG-FELT BUT UNSOLVED NEED

A long felt but unsolved need remains for a compact and maximally efficient oil recycling unit that is readily installed on modern automobiles. Previous devices have failed to gain widespread acceptance partially due to bulkiness. The requisite device size can be dramatically reduced by employing efficient mechanisms as claimed, including cavitation, squirting, and capillary-action dispersion mechanisms.

LACK OF IMPLEMENTATION

The invention has not previously been implemented. Considering the extraordinary advantages (for example, significantly reduced device size) afforded by the present invention and the fact that it has not yet been implemented suggest that the invention is not obvious.

SYNERGISM

The whole is greater than the sum of the parts; the invention exhibits synergy. For example, the resistive heating employed by the coil of the present invention is synergistic with its contaminant-removing electromagnetic properties. This combination obviates the need for two separate devices, one to heat the fluid and another to extract metallic particles via a magnet. The omission of requisite elements in the art of record (for example, Lowry would require two separate elements) is further evidence of unobviousness.

UNEXPECTED RESULTS AND SIGNIFICANT ADVANTAGES

In **In re Wiechert**, 370 F.2d 927, 152 USPQ 247 (CCPA 1967) a significant improvement over the related art was held sufficient to rebut prima facie obviousness based on close structural similarity. Similarly, in **In re Waymouth**, 499 F.2d 1273, 182 USPQ 290, 293 (CCPA 1974), the court held that unexpected results for a claimed range as compared with the range disclosed in the art of record had been shown by a demonstration of "a marked improvement, over the results achieved under other ratios, as to be classified as a difference in kind, rather than one of degree." The present invention provides a marked improvement over the references cited or combinations thereof, as discussed more fully below.

Evidence of unexpected properties may be in the form of a direct or indirect comparison of the claimed invention with the closest prior art (see **In re Boesch**, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and MPEP 716.02(d) - 716.02(e)). Hence, Applicant's following comparisons of the present invention with the art of record should be sufficient to establish unexpected properties.

None of the art of record discloses a contaminant-removal system that can be efficiently installed at an angle. This is a significant advantage. Use of an oil cleaning system installed at an angle is particularly advantageous when the devices must be installed on modern automobiles with minimal space.

Furthermore, as discussed above, none of the references disclose mechanisms for implementing cavitation contaminants or squirting to maximize contaminant removal, which could exponentially increase evaporation efficiency and effectiveness, significantly reducing the requisite size of the evaporation chamber and accompanying device. Applicant asserts that experimental evidence is not required to conclude that such results are afforded by such mechanisms, which are claimed by Applicant.

REQUEST FOR ASSISTANCE PURSUANT TO MPEP 707.07(J)

Since the claims define novel structure that produces new, unexpected, not suggested, and unanticipated results as described above, Applicant submits that such claims are clearly patentable. Therefore, it is submitted that patentable subject matter is

present. If Examiner agrees that Applicant has presented patentable material but does not feel that the present claims are technically adequate, Applicant respectfully requests that Examiner write acceptable claims pursuant to MPEP 707.07(j).

CONCLUSION

None of the references taken alone or in combination, teaches, discloses, or suggests the invention as presently claimed. The present Application is believed to be in proper form for allowance. Accordingly, allowance, and passage to issue are respectfully requested.

Applicant asserts that all limitations added to the claims by this Amendment are reasonable and are primarily clarifications of limitations already implied in Applicant's original claims. Accordingly, if Examiner cites additional art in the subsequent Office Action, Applicant requests that that action not be made final per MPEP 706.07(a) (§ 3). Furthermore, since Applicant is seeking to define Applicant's invention in claims that will give applicant justly entitled patent protection, prosecution should not be prematurely cut off (MPEP 706.07).

Furthermore, since Applicant's Declaration was apparently not entered and Applicant was not given a chance to remedy any factors causing it to not be entered, Applicant should be afforded an opportunity to respond to an Office Action with the Declaration being considered. Furthermore, since the restriction groupings were changed in the above-identified Office Action, Applicant should have an opportunity to respond to the new suggested restriction. Accordingly, Applicant requests that the subsequent Office Action not be made final.

Applicant has attempted to reach Examiner by telephone at the number listed (703-308-3854) to discuss the Office Action, and particularly the lack of consideration given to Applicant's Affidavit under Rule 131. However, Examiner's number as of February 13, 2004 is not in service.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 12, 2004.

Respectfully submitted,

Robert de Sylva 6-10-04

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